

## WHAT IS CLAIMED IS:

1. A bottom-up electrospinning devices, comprising: a spinning liquid main tank 1; a metering pump 2; a nozzle block 4; nozzles 5  
5 installed on the nozzle block; a collector 7 for collecting fibers being spun from the nozzle block; and a voltage generator 9 for applying a voltage to the nozzle block 4 and the collector 7,

wherein: [A] the outlets of nozzles 5 installed on a nozzle block 4 are formed in an upper direction; [B] a collector 7 is located on the top  
10 part of the nozzle block 4; and [C] a spinning liquid discharge device 12 is connected to the uppermost part of the nozzle block 4.

2. The devices of claim 1, wherein a spinning liquid dropping device 3 is installed between the spinning liquid main tank 1 and the  
15 nozzle block 4.

3. The devices of claim 1, wherein the nozzle block 4 is bilaterally reciprocated as a whole.

20 4. The devices of claim 1, wherein a heating device is installed in the collector 7.

5. The devices of claim 1, wherein a stirrer 11c is installed in the

nozzle block 4.

6. The devices of claim 1, wherein a spinning liquid discharge device 12 forcedly feeds an excessively fed spinning liquid to the spinning  
5 liquid main tank 1 by a suction air.

7. The devices of claim 1, wherein the collector 7 is fixed or continuously rotates.

10 8. The devices of claim 1, wherein the nozzles 5 located on the nozzle block 4 are arranged on a diagonal line or a straight line.

9. The devices of claim 1, wherein the outlets of the nozzles 5 are formed in more than one horn having an angle  $\theta$  of 90 to 175°.

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10. The devices of claim 1, wherein the nozzle block 4 comprises:  
[A] a nozzle plate 4e with nozzles 5 arranged thereon; [B] nozzle circumferential holes 4b surrounding the nozzles 5; [C] a spinning liquid temporary feed plate 4d connected to the nozzle circumferential holes 4b  
20 and located right above the nozzle plate 4e; [D] an insulator plate 4c located right above the spinning liquid temporary feed plate 4d; [E] a conductive plate 4h having pins arranged thereon in the same way as the nozzles are and located right below the nozzle plate 4e; [F] a spinning

liquid main feed plate 4f including the conductive plate 4h therein; [G] a heating device 4g located right below the spinning liquid main feed plate 4f; and [H] a stirrer 11c installed within the spinning liquid main feed plate 4f.

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11. Nanofibers produced by the bottom-up electrospinning devices of claim 1.

12. A method for coating nanofibers, wherein a nanofiber is  
10 continuously or discontinuously coated on a coating material by the bottom-up electrospinning devices of claim 1.

13. The method of claim 12, wherein the coating material includes a nonwoven fabric, a woven fabric, a knitted fabric, a film or a membrane  
15 film.

14. The method of claim 12, wherein nanofibers are coated in a multilayer by electrospinning more than two kinds of spinning liquids on the coating material, respectively, by respective bottom-up  
20 electrospinning devices.

15. A method for producing a hybrid type nanofiber web by consecutively arranging more than two bottom-up electrospinning

devices of claim 1 and then electrospinning more than two kinds of spinning liquids sequentially on the collector 7 by the respective electrospinning devices.

- 5           16. A method for producing a hybrid type nanofiber web by stacking more than two kinds of nanofiber webs electrospun respectively by the bottom-up electrospinning devices of claim 1.

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